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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/539,918	03/31/2000	James M. Florence	BWD:7146.063	9507

7590

07/18/2003

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EXAMINER

DI GRAZIO, JEANNE A

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 07/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/539,918

Applicant(s)

FLORENCE ET AL.

Examiner

Jeanne A. Di Grazio

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6, 8-11 and 13-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8-11, and 13-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Effective Filing Date: March 31, 2000.

This Action replaces the First Office Action mailed Sept. 16, 2002.

By Amendment of April 28, 2003, claims 5, 7, and 12 have been cancelled. Claims 1-4, 6, 8-11, and 13-43 are pending in the Application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 8, 11, and 13-15 rejected under 35 U.S.C. 102(b) as being anticipated by Reinsch (US 5,565,933).

Per claims 1, 8, and 11: Referring to Figure 1, a light source (18), a polarizing device (color switching apparatus 20), a polarizing beam splitter (30), LCD panel (LC light valve, 12), projection source (26, 28), and color component rotator (38, 40, 48) optically located between the polarizing device and projection source (Figures 1 and 2) wherein at least a portion of said light passes through said color component rotator, wherein said color component rotator changes the polarization state of a first wavelength of said light incident thereon while being free from changing the polarization state of a second wavelength of light incident thereon (Col. 2, Lines 31-41).

Per claims 3 and 15: Reinsch has multiple color component rotators (38, 40, and 48).

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Per claims 13 and 14: Light from a light source is separated into three color components (red, blue, and green) see Figure 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinsch (US 5,565,933) in view of Huang et al. (USPN 6,304,302 B1)(J. Huang).

Per claim 2: Reinsch does not appear to have a color component rotator between a polarizing beamsplitter and light source; however, J. Huang discloses a half-wave plate [305] between an optical film [302] and projection lens [311] where the optical film acts as a polarizing device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Reinsch in view of Huang for an optical film that acts as a polarizing device in a liquid crystal projector.

Per claim 9: Reinsch does not appear to have a pair of relay lenses; however, it may be implied in Huang that Huang has relay lenses to focus and retransmit images.

Claim 4, 6, 10, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinsch (US 5,565,933) in view of Huang et al. (USPN 6,304,302 B1)(J. Huang) and further in view of Huang et al. (US 6,309,071 B1).

Per claims 4, 6, and 16: Reinsch does not appear to have a second and third LCD panel; however, Huang has second and third LCD panels for generating a second (and third) image,

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respectively. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Reinsch in view of Huang for generating second and third color images in an LCD projector.

Per claim 10: Reinsch does not appear to have a dichroic filter; however, Huang discusses the use of dichroic filters in the prior art [Col. 1, Lines 29-31] to separate light into separate color components. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Reinsch in view of Huang for a dichroic filter that separates light into its various components.

Claims 17, 18, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinsch (US 5,565,933) in view of Huang et al. (USPN 6,304,302 B1)(J. Huang).

Per claims 17, 18, and 21-24: Reinsch has a light source, polarization converter, projection source for projecting images, and at least two color component rotators, each of said color component rotators being located between said polarization converter and said projection source and wherein at least a portion of light passes through at least one of the color component rotators and at least a portion of light passes through another one of the color component rotators (Col. 2, Lines 31-41). Reinsch does not appear to have a second and third polarizing beam splitter; however, Huang has multiple PBSs and multiple LCD panels (light valves) as common elements in the art of projection systems for light valves. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Reinsch in view of Huang for the distribution and synthesis of a full range of colors in an LCD projector.

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Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reinsch (US 5,565,933) in view of Huang et al. (USPN 6,304,302 B1)(J. Huang) and further in view of Takahara et al. (US 6,142,633).

Per claim 19: Reinsch does not appear to have a fly's eye lens and prism array; however, Takahara et al. discloses a polarization conversion element near a fly's eye lens and near a prism (Prior Art, FIG. 21) for the purpose of converting various polarized light components into unidirectionally polarized light. It would have been obvious, at the time the invention was made, to make the polarization conversion element out of the fly's eye lens plate and prism (as opposed to near these elements) in order to reduce the size of the optical system. It is generally always preferable to reduce the size of complex optical systems for ease of manufacturing and cost.

Claims 20, and 25-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinsch (US 5,565,933) in view of Huang et al. (USPN 6,304,302 B1)(J. Huang) in view of Hashizume (US 6,089,718).

Per claims 20, and 25-31: Reinsch does not appear to have a dichroic filter and crossed dichroic prism; however, Hashizume has dichroic filters defining at least two color channels, and one of said polarizing beam splitters is located in one of said color channels and the other of said polarizing beam splitters is located in the other of said color channels. Dichroic filters reflect certain wavelengths and transmit other wavelengths; thus, a dichroic filter defines a given color channel. The placement of a beam splitter in a given channel acts to reflect wavelengths of a given state and to transmit wavelengths of another given state. Dichroic filters and beam splitters act in concert with each other, reflecting and transmitting appropriate wavelengths. Hashizume (USPN 6,089,718) discloses the use of a crossed dichroic prism in a projection display device for

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the purpose of forming a color image by synthesizing light of three colors [Col. 9, Lines 23-25]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Reinsch in view of Hashizume for the reflection and transmission of light of appropriate wavelengths.

Claims 32-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinsch (US 5,565,933) in view of Hashizume (USPN 6,089,718).

Per claims 32-43 (method): Reinsch does not appear to disclose the method of color switching; however, Hashizume discloses light converted to a single polarization state, green light separated from red and blue light, changing polarization states and separating polarization states of light, and forming and projecting images. Polarizing beam splitters function, in part, to generate images. The generation of images can be accomplished via one, two, or three PBSs. The use of a dichroic filter or PBS to separate light is a matter of preference that may take into account manufacturing ease, convenience, and cost. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Reinsch in view of Hashizume for manufacturing ease, simplicity, and cost reduction.

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Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Jeanne A. Di Grazio whose telephone number is (703)305-7009. The Examiner can normally be reached on M-F.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Robert Kim, can be reached on (703)308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-8741 for regular communications and (703)746-8741 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Jeanne Andrea Di Grazio

Robert Kim, SPE

JDG

July 14, 2003


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